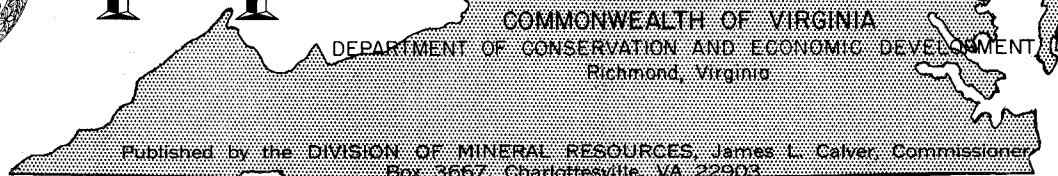


# VIRGINIA



# MINERALS



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## THE MINERAL INDUSTRY OF VIRGINIA IN 1966<sup>1</sup>

A record-breaking output of coal more than offset value declines in other mineral commodities, and the total value of mineral output in Virginia in 1966 rose to a new high of \$274 million, 2 percent greater than in 1965, the previous record high value year. Less than two-fifths of the mineral commodities gained in value, compared with over four-fifths in 1965. Slackened construction activity, particularly in residential housing and certain phases of highway construction, was reflected in decreased production of stone, cement, and gypsum. Fifty-six percent of the total value of mineral production in Virginia was contributed by fuels (52 percent in 1965), 41 percent by nonmetals (45 percent in 1965), and 3 percent by metals (3 percent in 1965).

Virginia Electric and Power Company reportedly will construct nuclear generating facilities at the Surry power plant on the James River in Surry County. Two nuclear units are planned with a capability of approximately 800,000 kilowatts per unit; each will be of the pressurized water reactor type. Construction is scheduled for completion in 1971.

A new transloading facility of the General Coal Company at Appalachia became operative in late 1966. The immediate area served by the company's new facility has no single mine that has the capacity or fast-loading ability to partici-

pate alone in unit-train movement; this transloading operation enables several mines to pool their production and to facilitate marketing. Coal is shipped to the transloader on an intransit freight rate, rotary dumped, stored in silos, and then reloaded rapidly into 6000 and 10,000 ton unit trains. The overall result is reduced delivered costs.

Development work preparatory to construction of a new mine in Buchanan County by Island Creek Coal Company has been started in that company's reserves. The new mine is the third to be developed in the Pocahontas coal reserves which have been estimated to exceed a half billion tons of low-volatile coal. The first mine, a joint venture with Republic Steel Corporation, known as the Beatrice Pocahontas mine, one of the deepest coal mines in North America, will be exceeded in depth by the newest mine. A second mine (the Virginia Pocahontas No. 1) started in mid-1965, is expected to be initially productive in late 1967; the third mine, the Virginia Pocahontas No. 2, is scheduled to begin production late in 1968 and achieve full capacity of 2 million tons annually in 1971.

Output of lime and also of limestone will increase as a result of expansion and modernization programs of several large lime producers in Virginia. Foote Mineral Company is developing a second underground mine in limestone at Kimballton, Giles County, with production expected in 1967. The output will be used in the company's adjacent lime plant. Production of lime will be

<sup>1</sup> Prepared by the Bureau of Mines, U. S. Department of the Interior, under a cooperative agreement with the Virginia Division of Mineral Resources for collecting information on all minerals except fuels.

Table 1.—Mineral production in Virginia<sup>1</sup>.

Mineral	Quantity	1965		1966	
		Quantity	Value (thousands)	Quantity	Value (thousands)
Clays ..... thousand short tons	1,415		\$ 1,657	1,486	\$ 1,813
Coal (bituminous) ..... do	34,053		139,291	35,565	153,341
Gemstones .....	NA		7	NA	7
Lead (recoverable content of ores, etc.) ..... short tons	3,651		1,139	3,078	930
Lime ..... thousand short tons	847		10,584	840	10,486
Natural gas ..... million cubic feet	3,152		942	p/ 2,900	p/ 870
Petroleum (crude) ..... thousand 42-gallon barrels	4		W	1	W
Sand and gravel ..... thousand short tons	15,322		18,019	17,191	16,635
Soapstone ..... short tons	3,549		9	3,989	10
Stone ..... thousand short tons	36,350		59,397	34,151	55,550
Zinc (recoverable content of ores, etc.) <sup>2</sup> ..... short tons	20,491		5,942	17,666	5,123
Value of items that cannot be disclosed:					
Aplite, portland cement, masonry cement, feldspar, gypsum, iron ore (pigment material), kyanite, salt, titanium concentrate (ilmenite and rutile), and values indicated by symbol W .....	—		30,990	—	29,127
Total .....	—		\$267,977	—	\$273,892

p/ Preliminary. NA Not available. W Withheld to avoid disclosing individual company confidential data.

<sup>1/</sup> Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

<sup>2/</sup> Recoverable zinc valued at the yearly average price of prime western slab zinc, East St. Louis market. Value established after transportation, smelting, and manufacturing charges have been added to the value of ore at the mine.

substantially increased when a new kiln becomes operational in 1967. National Gypsum Company's Kimballton lime plant and limestone mine are also undergoing expansion. New facilities will include additional mining and crushing equipment, an additional kiln (the third), and a complete dust-collecting system. Present capacity is expected to be almost doubled when the changes are completed. Olin-Mathieson Chemical Corporation began improvements at its Saltville chemical complex in Smyth County. Included in the scheduled modernization, expected to be completed in 1968, are changes in soda-ash and lime-production facilities to enable increased output of both products.

### Mineral Fuels

**Coal (Bituminous).**—Spurred by the ever-increasing demand for electrical energy, the output of coal increased in five of the eight coal-producing counties and rose to 36 million short tons—4 percent more than in 1965, the previous record year. Production data includes coal produced from deposits within Virginia, whether the mine opening is or is not inside the State boundary and excludes operations producing less than 1000 tons per year. Consequently, production data published by the Federal Bureau of Mines may differ somewhat from data published by the State. The

value of mine output increased 10 percent over that of 1965; the greater-than-proportional value increase was due to a 5-percent rise in average value per ton (\$4.31) in 1966 over the \$4.09 in 1965. The total value (\$153 million) was less than 1 percent lower than the \$154 million reported in the peak value year, 1957.

Both high- and low-volatile bituminous coals were produced for domestic and industrial purposes and for export. A small quantity of semi-anthracite coal was mined in Montgomery County. Forty-six percent of Virginia's coal tonnage was produced in one county, Buchanan; 62 percent of the State's coal mines were in this county. Four of the eight southwestern counties in which coal was mined—Buchanan, Dickenson, Russell, and Wise—accounted for 98 percent of the total output, compared with 97 percent in 1965.

Virginia's record-breaking production of coal was accomplished by 139 fewer mines of all types than in 1965. Underground production accounted for 84 percent of the total output, 2 percent less than in 1965, but almost 400,000 additional tons of coal were mined with 151 fewer underground mines than the 1153 active in 1965. The number of strip and auger mines rose to 65 and 65, respectively, compared with 56 and 62 in 1965.

Sixty-seven percent of the total underground output was mechanically loaded, 10 percent higher than in 1965 and 22 percent higher than in 1964. These increases reflect the trend toward modernization and mechanization in underground mining in Virginia.

Two hundred sixty-five mobile loading machines (88 more than in 1965) accounted for 59 percent of the mechanically loaded tonnage; 80 continuous mining machines (24 more than in 1965) accounted for 40 percent, and hand-loaded face conveyors accounted for the remaining 1 percent. Of the total coal mined, 49 percent was mechanically cleaned in 36 plants (3 more than in 1965). Wet washing other than with jigs was the principal method of cleaning, accounting for 76 percent of the cleaned coal. Forty-four percent of the cleaned coal was thermally dried. Thirty-eight percent of the total coal mined was crushed. Fifteen percent of the total coal produced was treated with dust-allaying and anti-freezing preparations, of which oil predominated (99 percent).

**Coke.**—Beehive coke was produced in six plants (five companies), one plant in Buchanan County and five in Wise County.

**Petroleum and Natural Gas.**—Natural gas production data in Table 1 are reported to the Bureau of Mines by pipeline companies. The production data recorded by the Virginia Department of Labor and Industry, Division of Mines and Quarries, was 4249 million cubic feet, almost 1 percent more than the 4210 million cubic feet reported by this agency in 1965. Tazewell County led in output, with 64 percent of the production reported by the State (58 percent in 1965); Buchanan and Dickenson produced 25 and 11 percent, respectively (28 and 14 percent, respectively, in 1965). Wells in the Berea (Mississippian) sandstone produced 2732 million cubic feet of gas in Tazewell County; producers were Consolidation Coal Company and United Fuel Gas Company. Principal producers in Buchanan County were Ashland Oil and Refining Company, P & S Oil and Gas Corporation, Cabot Corporation, and United Fuel Gas Company, and the total output in the county was 1071 million cubic feet. In Dickenson County the Clinchfield Coal Company, Division of the Pittston Company, operated 41 wells producing 447 million cubic feet of gas during the first 10 months of 1966; there was no production during November and December because of a labor dispute in eastern Kentucky

where the gas is marketed. At the end of the year the American Gas Association estimated the reserves of natural gas in Virginia to be 37,586 million cubic feet—5110 million cubic feet more than the estimate for the previous year. During 1966 there were 104 producing gas wells compared with 99 in 1965, according to the Virginia Division of Mines and Quarries. Two gas wells were completed in 1966, one each in Buchanan and Tazewell counties. The output of natural gas from Buchanan and Tazewell counties was delivered to the pipelines of Consolidated Gas Supply Corporation and the Atlantic Seaboard Line; production from Dickenson County was delivered to the lines of the Kentucky-West Virginia Gas Company. Washington Gas Light Company operated LP gas storage facilities in Fairfax County. Storage capacity in a mined cavity (granite) for propane was rated at 300,000 barrels.

The output of crude oil was 1073 barrels, 2544 barrels less than the 1965 production and 4755 less than that of 1964. All the production was in Lee County. Five wells in the Rose Hill field produced 737 barrels, and 1 well in the Ben Hur field produced 336 barrels. Two new wells were started in the Ben Hur field late in 1966, and three drill-site locations have been made for possible drilling in 1967.

At Yorktown (Goodwin Neck) the American Oil Company operated a refinery with a crude oil capacity of 34,700 barrels per calendar day (as of January 1, 1966). Catalytic cracking and catalytic reforming capacity were 23,077 barrels and 7300 barrels per day, respectively. Coking capacity was 13,730 barrels per day. Total daily gasoline output capacity was 21,920 barrels. The American Oil Company also had under construction at Yorktown additional refining facilities with a crude oil distillation capacity of 4300 barrels per day and catalytic reforming capacity of 500 barrels per day.

### Nonmetals

**Aplite.**—Continuing an increasing trend, output and value of aplite were greater than in 1965. Production, chiefly for use in glass manufacture, was from Hanover and Nelson counties.

**Cement.**—Shipments and total value of portland cement decreased 5 percent and 10 percent, respectively; the greater-than-proportional total value decline was due to a unit value \$0.18 lower than in 1965. Masonry cement shipments declined

by almost one-tenth, but the total value was moderately higher due to a substantial increase in unit value in 1966. Portland cement plant capacity remained virtually unchanged during the year. Four plants manufactured cement; two plants made both portland and masonry cement, one plant made only portland cement, and one plant produced only masonry cement. The wet process of manufacturing portland cement was used by one plant, and two plants used the dry process. Cement was produced in Augusta, Botetourt, and Warren counties and the independent city of Chesapeake.

The cement producers mined limestone, shale, clay, and calcareous marl for their own use. Materials purchased for use in cement manufacture included sand, oyster shells, mill scale, various air-entraining compounds, and a variety of grinding aids. Over four-fifths of the electrical energy used was purchased.

Types I-II (general-use and moderate-heat types) comprised the bulk of portland cement produced and marketed; a limited quantity of Type III (high-early-strength) cement was produced and shipped. Both air-entrained and non-air-entrained types were produced; the latter type accounted for the bulk of production. Most of the shipments were in bulk and made by railroad, but sizable shipments were also made by truck. Shipments of cement in containers (paper bags) were also sizable and were made by railroad and truck.

The distribution of portland cement for various consumer uses was as follows: 60 percent to ready-mixed concrete companies (66 percent in 1965); 18 percent to concrete-products manufacturers (17 percent in 1965); 11 percent to contractors, including highway contractors (11 percent in 1965); 11 percent to other users, including building material dealers, Federal, State, and local government agencies, and miscellaneous customers (6 percent in 1965). Marketing areas for portland cement, in order of decreasing shipments, were chiefly Virginia, North Carolina, West Virginia, Georgia, Alabama, Florida, South Carolina, and Maryland.

**Clays.**—New records were set for clay output and value in 1966. Tonnage and value were 5 percent and 9 percent higher, respectively, than in 1965; the greater-than-proportional value increase was due to a \$0.05 increase in the average value per ton (\$1.17 per ton in 1965). Almost

seven-tenths of the clay and shale output was consumed in brick manufacture, compared with slightly less than two-thirds in 1965. The principal uses for the balance were lightweight aggregate and the manufacture of portland cement; some was also consumed in the making of vitrified sewer pipe, flue linings, pottery, clay dummies, (shot-hole tamping devices), and other clay products. Clay production was reported from 21 operations in 16 counties. The chief clay-producing counties in order of tonnage mined were Botetourt, Orange, Russell, Chesterfield, and Nansemond; in order of output value they were Orange, Botetourt, Prince William, Nansemond, and Chesterfield.

**Feldspar.**—Production was by the Clinchfield Sand and Feldspar Corporation from two mines in Bedford County. While the output decreased slightly compared with that of 1965, the total value increased moderately due to an increase in the average market value. Mixed feldspar (soda and potash) was mined near the company processing and grinding mill in Bedford. In order of decreasing tonnage the mill output was marketed chiefly in Maryland, Ohio, Pennsylvania, New York, and Illinois principally for pottery and enamel manufacture, although smaller quantities were used in the manufacture of welding-rod coatings, soap and abrasives, and for brick glaze.

**Gypsum.**—Output of crude gypsum decreased, compared with that reported in 1965. Gypsum mined near Chatham Hill, Smyth County, and at Plasterco, Washington County, was calcined or otherwise processed and manufactured into plasterboard and other gypsum products by United States Gypsum Company at its Plasterco plant. The company also processed imported gypsum at a plant near Norfolk for use in their products. Imported gypsum was processed by several firms in the Norfolk area for use as a land dressing.

**Kyanite.**—Production of crude kyanite ore and sales of the refined material to manufacturers of refractories and other ceramic products increased. Two mines and three processing plants were operated by the Kyanite Mining Corporation in Buckingham and Prince Edward counties, and the company also operated a grinding and bagging plant in Prince Edward County. Only a small part of the kyanite ( $\text{Al}_2\text{SiO}_5$ ) is used in the raw state; the bulk of production is calcined to synthetic mullite, one of the most important refractory materials used in the ceramic industry.

**Lime.**—Interrupting an increasing trend, both output and value of lime decreased slightly (1 percent) compared to 1965, the previous record production and value year. Sales of building lime declined 13 percent, sales of agricultural lime declined 7 percent, and sales of lime for chemical and other industrial uses declined by less than 1 percent. All but 4 percent of the lime sold or used, including both quicklime and hydrated lime, was consumed in chemical or industrial use. Ninety-one percent of the total production was quicklime and the balance was hydrated lime. Nine companies in six counties and one independent city reported the production of primary (excludes regenerated) lime. One company in Alleghany County reported production of regenerated lime and a limited production of primary lime calcined from purchased limestone. In decreasing order of output, Giles, Smyth, and Shenandoah counties were the chief lime-producing areas. Processing equipment used in lime manufacturing included pot, shaft, and rotary kilns and batch and continuous hydrators. Fuels used in calcining included natural gas, bituminous coal, and coke. Uses for quicklime included agricultural lime; the manufacture of alkalies, calcium carbide, and paper; flux in steel and electrometallurgical operations; sewage and trade-waste treatment; and miscellaneous applications. Hydrated lime was marketed principally for use in construction, purification, and treatment of water, leather tanning, sewage and trade-waste treatment, and agriculture. Principal marketing areas included the District of Columbia, Florida, Georgia, Kentucky, Maryland, North and South Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

**Nitrogen Compounds.**—Allied Chemical Corporation, Nitrogen Division, Hopewell, produced nitrogen compounds for use chiefly as fertilizer or fertilizer ingredients. Included among products manufactured were ammonia, urea, and ammonium sulfate.

**Salt.**—Olin-Mathieson Chemical Corporation, Saltville, Smyth County, produced chlorine, caustic soda, soda ash, and other chemicals from brine recovered from nearby captive salt wells. Production of salt was comparable to the output in 1965. The company has begun a multimillion dollar modernization program, including not only its chemical facilities but also its captive limestone and limemaking operations near the Saltville plant. The aerial tramway used to transport limestone from a nearby mine to the plant

will disappear as a Saltville landmark when proposed truck haulage of the limestone is begun.

**Sand and Gravel.**—Output of sand and gravel reached a new high in 1966, but value was less than in 1965, the previous year of both record production and value. The output increased 12 percent while the value decreased 8 percent compared to production (15 million tons) and value (\$18 million) reported in 1965. The decline in total value was due to the lower average value of \$0.97 per ton (\$1.18 in 1965) reported in 1966. Demand for sand and gravel used in building and road construction was largely responsible for the increase in output; production of commercial sand and gravel for these uses was substantially higher than in 1965.

Eighty percent of the commercial production (14 million tons) was used in building (26 percent) and paving (54 percent), compared to 78 percent (12 million tons) in 1965. Other sand and gravel uses included industrial silica applications (glass sand, engine sand, filler, and other uses), other construction uses (fill material), and miscellaneous and unspecified applications. Commercial output comprised 99.4 percent of the total production and virtually all of the value. The small remainder of the total output (0.6 percent) was State and local government production (0.1 percent in 1965). Sand comprised 66 percent of the total commercial sand and gravel output and 52 percent of the commercial value. Eighty-three percent of the total commercial sand and gravel output was washed, screened, or otherwise prepared, compared with 69 percent in 1965. Sixty-eight percent of the commercial tonnage was shipped by truck, and most of the remainder by waterway or railroad; a small quantity was used at the producing plant or transported by unspecified methods.

Production of sand and gravel was reported from 30 counties and 5 independent cities. In order of decreasing output, the principal sand and gravel producing areas were the city of Virginia Beach and Fairfax, Chesterfield, Henrico, and Prince George counties. Over five-sixths of both the total output and value were contributed by these five producing areas.

Of the 60 commercial sand and gravel operations reported during 1966 (51 in 1965), 5 had an output range of 1,000,000 tons or over and accounted for 36.2 percent of the output; 1 had an output range of from 500,000 to 1,000,000 tons and accounted for 5.2 percent; 28 had an output

range of from 100,000 to 500,000 tons and accounted for 53.1 percent; 9 had an output range of from 50,000 to 100,000 tons and accounted for 3.5 percent; and 17 had an output range of up to 50,000 tons and accounted for 2 percent of production.

**Stone.**—Virginia's stone production in 1966 declined 6 percent in both output and value, interrupting the increasing trend established over the past 8 years. However, 1966 was still the second highest production year on record for stone output. Predominantly responsible for the decline in the output of stone, the second most important mineral commodity produced in Virginia, was a lessened demand for construction aggregates (concrete aggregate and roadstone); the output of stone for this use was over 2 million tons less than in 1965.

Many types of stone were mined or quarried in Virginia, including limestone, granite, basalt (including traprock and diabase), sandstone, slate, calcareous marl, miscellaneous stone, and marble, in order of decreasing output. Seventy-two percent of the total stone output was used as concrete aggregate and roadstone (74 percent in 1965); 12 percent was used in the manufacture of cement and lime; 3 percent was used as metallurgical fluxstone; and the remaining 13 percent was used as agricultural dressings, railroad ballast, riprap, stone sand, and in unspecified applications. Limestone, either as stone or as lime, had additional application in the chemical (including metallurgical), glass, and paper industries. Marine shell, most of which was dredged from the Chesapeake Bay area, together with a limited quantity obtained as a product of oyster and other mollusk processing, was used mainly as an aggregate in road construction, in the manufacture of cement and lime, and as agstone (agricultural liming material). Roofing granules were produced from crushed slate by a firm in Buckingham County. Output of limestone, granite, and basalt, the three leading stone types produced, accounted for over nine-tenths of the total stone production. Crushed or broken material comprised virtually all (99.8 percent) of the total stone production and 92 percent of the total value. Dimension stone accounted for 0.2 percent of the production and for 8 percent of the value.

Limestone (including dolomite and dolomitic limestone) and granite, the leading stone types, accounted for more than five-sixths of the total stone tonnage and more than three-fourths of the

value. Over one-half of the limestone output and almost all of the granite were used as construction aggregates. Limestone decreased in output and value and granite increased; both the decrease and increase were moderate. The crushed or broken material was chiefly produced; only a limited amount of dimension limestone and no dimension granite were reported in Virginia in 1966. Basalt (including traprock and diabase), the third leading stone produced in Virginia, decreased moderately in output and value due to decreased output of the crushed material; a limited amount of dimension basalt was produced. Output and value of crushed sandstone increased substantially; a limited quantity of dimension sandstone was also produced. Production and value of miscellaneous dimension stone, including soapstone and "Virginia greenstone," decreased moderately; a limited output of crushed miscellaneous stone was reported. Whereas the output of dimension slate was 7 percent less than in 1965, the value rose by 12 percent due to higher prices paid for the fabricated products in 1966. Output and value of crushed slate increased; the more-than-proportional value gain was due to a higher unit value in 1966. Output of calcareous marl, used in cement manufacture and agricultural applications, decreased. A limited quantity of crushed marble was processed for use as terrazzo.

Commercial stone production, including marine shell, was reported in 53 counties and 1 independent city (Chesapeake). More than 1 million tons of stone were produced in each of 11 counties, and there were 23 counties with output valued in excess of \$1 million each. Government-and-contractor stone was produced in 7 counties.

**Sulfur.**—Hydrogen sulfide was recovered from fuel gas and converted to sulfur by the American Oil Company at its Yorktown refinery in York County. Although shipments were less than in 1965, the value of shipments was higher.

### Metals

**Ferroalloys.**—Ferromanganese was produced by blast-furnace reduction of imported ore by E. J. Lavino and Company, Division of International Minerals and Chemicals Corporation, near Lynchburg.

**Iron Ore (Pigment Material).**—Crude brown and yellow iron oxide pigments were produced by one firm near Hiwassee, Pulaski County. This firm also produced brown, red, and yellow natural

iron oxide pigments, and a variety of finished natural and manufactured pigments at operations near Hiwassee and Pulaski. The materials used for pigment manufacture included manufactured oxides, imported oxides, and iron oxides from local deposits. Iron oxide pigments were also produced from imported hematite by another firm near Henry, Franklin County. Total marketed output of iron oxide pigments increased moderately.

**Lead and Zinc.**—Production of lead and zinc ore was limited to two mines in Wythe County, operated by one company. Although the operation of the mines was continuous throughout the year, output of crude ore was at a lower monthly rate; consequently, production of both lead and zinc was less than in 1965. Lead and zinc output declined 16 percent and 14 percent, respectively.

**Titanium Concentrates.**—Marketed production of titanium concentrates was slightly less than in 1965, but value of shipments was 4 percent lower due mainly to a lower unit value in 1966. Shipments and value of both ilmenite and rutile decreased. The declines were slight for ilmenite, and moderate for rutile. Ilmenite was produced by American Cyanamid Company, Pigments Division, in Amherst County, and both ilmenite and rutile were produced by M & T Chemicals, Inc., in Hanover County.

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#### NEWS NOTES

Ararat Rock Products Inc. has opened a quarry in dolomite about 2 miles south of Blacksburg, Montgomery County, and Salem Stone Corporation has opened a quarry in dolomite about 1 mile northwest of Dixie Caverns in Roanoke County. Both operations use portable plants to produce crushed stone for use mainly in highway construction.

The quarry of the Valley Stone Company near Staunton, Augusta County, was acquired by Vulcan Materials Company, Mideast Division, in April 1967 and is now operated as the Valley Stone Quarry of that division. Limestone and dolomite produced at this quarry are crushed for use primarily as roadstone and concrete aggregate. Vulcan Materials Company also began production of crushed stone at their new Mint Springs Quarry about 4 miles south of Staunton on August 1, 1967. A portable plant is utilized at this quarry to crush carbonate rocks for use in the construction of Interstate Highway 81.

The Allied Chemical Corporation, Industrial Chemicals Division, discontinued the manufacture of sulfuric acid at their facility in Pulaski in June 1967, and will dismantle the plant. The company will maintain a small work force to operate other installations at the Pulaski site. The Pulaski plant used pyrrhotite ore from the company's Gossan mine in Carroll County as a raw material for sulfuric acid from 1905 until 1962. In 1962 the mine was shut down and sulfur shipped from the Gulf Coast replaced pyrrhotite as a raw material.

E. J. Lavino and Company, Division of International Minerals and Chemical Corporation, suspended operations for an indefinite period at their plant in Lynchburg during August 1967. The plant utilized imported manganese ore and coke and fluxing stone from Virginia as raw materials in the manufacture of ferromanganese for use by the steel industry.

The Wheelwright Corporation, a subsidiary of Penn Virginia Corporation of Philadelphia, will construct a new lightweight aggregate plant near the James River about 5 miles south of Richmond in Chesterfield County. The facility will be adjacent to the Chesterfield power station of Virginia Electric and Power Company and will utilize as raw material fly ash conveyed from the steam-generating plant. The product will be marketed to the concrete block and ready-mix concrete industries. Completion of the new plant is planned for early 1968.

The Westmoreland Coal Company will develop a new 5000 ton per day coal mine in Wise County at an estimated cost of \$4,000,000. This all-conveyor mine, to be known as the Bullitt mine, will be developed in a reported 35 million ton reserve in the Dorchester seam adjacent to the new coal transloading facility of the General Coal Company at Appalachia (See *Virginia Minerals*, August 1967). Coal from the Bullitt mine will be conveyed by belt to the transloader, which currently loads 3 million tons of coal per year for distribution by railroad to utilities in the southeast. The new mine is scheduled to begin production in January 1969 and deliver 1.2 million tons per year to the transloader.

Worley Ready Mix Concrete, Inc., opened a quarry in granitic rock near Boones Mill, Franklin County, in June 1967. The company operates a portable plant at the site to produce crushed stone for use as roadstone and concrete aggregate.

## Virginia Division of Mineral Resources

Box 3667

Charlottesville, VA 22903

Return Requested

### ADDITIONS TO STAFF

Mr. Palmer C. Sweet joined the Division staff on September 18, 1967, and will assist with economic studies and investigations. He received a B.A. degree in geology from the College of William and Mary in August 1967.

Mr. H. Michael Penley began employment with the Division on September 18, 1967, to assist in the transfer of geologic map data to new 7.5-minute topographic quadrangles. He has completed all the requirements for a B.S. degree in geology and physical geography from East Tennessee State University.

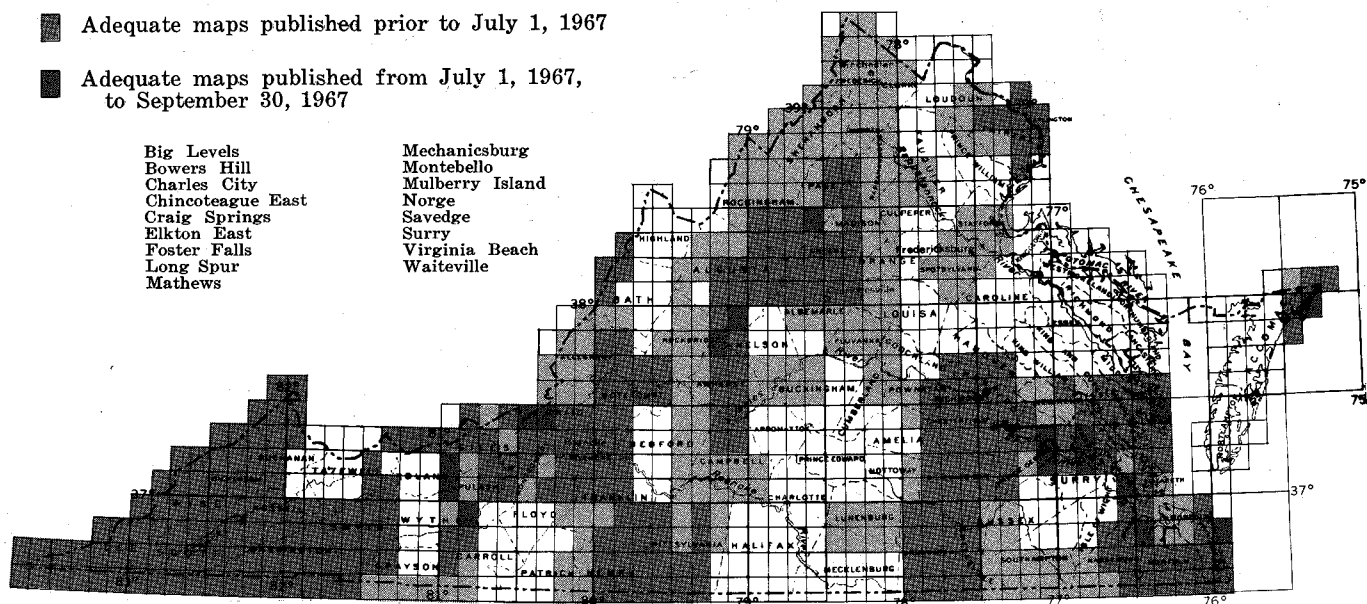
### TOPOGRAPHIC MAPS

#### 7.5-Minute Quadrangle Topographic Maps

- Advance prints and revision compilations
- Adequate maps published prior to July 1, 1967
- Adequate maps published from July 1, 1967, to September 30, 1967

Big Levels  
Bowers Hill  
Charles City  
Chincoteague East  
Craig Springs  
Elkton East  
Foster Falls  
Long Spur  
Mathews

Mechanicsburg  
Montebello  
Mulberry Island  
Norge  
Savage  
Surry  
Virginia Beach  
Waiteville



#### ADVANCE PRINTS AND REVISION COMPILATIONS

Advance prints and copies of revision compilations are available at 50 cents each from the U. S. Geological Survey, Topographic Division, 1109 N. Highland St., Arlington, VA 22210.

#### PUBLISHED MAPS

State index is available free. Published maps are available at 50 cents each from the Virginia Division of Mineral Resources, Box 3667, Charlottesville, VA 22903.